

ACOUSTICS2008/1135
Production and perception of goal-points and coarticulations in music

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From our studies of sound-related movement (<http://musicalgestures.uio.no>), we have reason to believe that both sound-producing and sound-accompanying movements are centered around what we call goal-points, meaning certain salient events in the music such as downbeats, or various accent types, or melodic peaks. In music performance, these goal-points are reflected in the positions and shapes of the performers' effectors (fingers, hands, arms, torso, etc.) at certain moments in time, similar to what is known as keyframes in animation. The movement trajectories between these goal-points, similar to what is known as interframes in animation, may often demonstrate the phenomenon of coarticulation, i.e. that the various smaller movements are subsumed under more superordinate and goal-directed movement trajectories. In this paper, we shall present a summary of recent human movement research in support of this scheme of goal-points and coarticulations, as well as demonstrate this scheme with data from our ongoing motion capture studies of pianists' performance and other researchers' motion capture data.